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ABSTRACT

Using data from the 1971 National Longitudinal Survey of middle-aged males, this survey simultaneously examines wage differentials in unionized and nonunionized employment in both the public and private sectors. Unlike previous studies conducted by Daniel S. Hamermesh, and Walter Fogel and David Lewin, this study includes a large sample that is employed (1,744 whites and 713 blacks), and utilizes controls such as the effect of individual characteristics, region, city size, and occupation group. Within a human capital framework, separate differentials are estimated for white-collar and blue-collar workers, and for whites and blacks. The data indicate that public sector unions have been unsuccessful in raising the earnings of white-collar employees in government, but that they have raised the earnings of blue-collar workers. The evidence also suggests that collective bargaining is more profitable for blacks than whites in the private sector, but that in governmental positions its effect is the same for both racial groups. In general, government unions are not more powerful than their private counterparts since the earnings of unionized public workers are either equal to or somewhat below those of private unionized employees. (Author/ELG)

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Earnings Differentials Among Unionized Workers in the Public and Private Sectors

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Earnings Differentials Among Unionized Workers
in the Public and Private Sectors

Abstract

Using data from the 1971 National Longitudinal Survey of older males, this study simultaneously examines wage differentials in unionized and non-unionized employment in both the public and private sectors. Within a human capital framework, separate differentials are estimated for white-collar and blue-collar workers, and for whites and blacks. The data indicate that public sector unions have not been successful in raising the earnings of white-collar workers within government, cet. par., but that they have raised the earnings of blue-collar workers. However, comparison of union wage effects in the public sector with those in the private sector indicates that public sector union wage effects are generally comparable to or smaller than union wage effects in the private sector.

The rapid growth in recent years of collective bargaining in the public sector has stimulated considerable interest in the consequences of public sector unionization. In particular, debate over the desirability of unionization, collective bargaining, and the right to strike of public employees is often accompanied by (untested) assertions regarding the pay of unionized and nonunionized public employees relative to that of their counterparts in the private sector. This paper provides an empirical analysis of the role of unionism in public sector wage determination, by simultaneously examining wage differentials in unionized and nonunionized employment in both the government and private sectors.[1] In addition, the effects of race on wages are examined.

A number of studies have examined the relative earnings of government employees.[2] Most earlier studies concentrated on the public/private differential without explicitly considering union wage effects in the two sectors. More recently, however, a number of studies have been published which examine union wage effects in the public sector. Various investigators have studied the effects of collective bargaining and unionization on the earnings of teachers,[3] fire fighters,[4] and other groups of municipal employees.[5] In general, these investigators have concluded that unions in the public sector have had only a small to moderate impact on the earnings of government workers. It should be emphasized that this conclusion is limited to the specific occupations or level of government (municipal) covered by the studies.

An important aspect of this study, then, is that it considers workers across a wide range of occupations and for all levels of government. In

addition, unlike the studies mentioned above, this one simultaneously examines union wage effects in both the public and private sectors. Two previous studies that do consider union wage effects for a broad cross-section of occupations and in both the public and private sectors are those of Hamermesh[6] and of Fogel and Lewin.[7]

Using microeconomic data for 1968 (the University of Michigan's Survey of Consumer Finances), Hamermesh estimates earnings equations controlling for union status and class of worker (public/private) simultaneously, and controlling for worker "quality" (i.e., individual worker characteristics which are likely to influence earnings). He concludes that while there does appear to be a positive union wage effect of up to 9 percent within the government sector, the union wage effect in government is no larger (and perhaps smaller) than the union wage effect in the private sector.[8] However, Hamermesh acknowledges that the relatively small fraction of his sample in government employment (11 percent) and the even smaller fraction that consists of unionized government workers (2.4 percent) lead to large standard errors on the estimated effects of unions in the public sector. In addition, Hamermesh used union membership rather than collective bargaining coverage to identify workers as "unionized." Hence, his conclusions must be viewed with some caution.

Fogel and Lewin, in their wide-ranging analysis of public sector wage determination, conclude that wages in the public sector are generally higher than those in the private sector for blue-collar and lower-level white-collar jobs, but lower for higher-level professional and managerial

jobs.[9] They do not provide any substantive analysis of union wage effects within the public sector;[10] however, they argue that for occupations in which unionized workers in the private sector have been able to obtain a wage advantage over their nonunion counterparts, public sector wages will be at least equal to the (higher) private union wage level.[11] Fogel and Lewin's empirical analysis consists primarily of comparisons of pay levels for similar jobs--but, like several other studies of government pay differentials,[12] there is no explicit effort to control for individual worker characteristics that are likely to influence earnings (e.g., schooling, work experience). The empirical work in this paper will utilize such controls.

Union Wage Effects in the Public and Private Sectors

Through the use of strikes and other bargaining tactics, unions in the private sector have been able to raise the wages of the workers they represent.[13] Are there a priori reasons to expect that unions will be stronger (or weaker) in the public sector than in the private sector? Two factors that are often cited to suggest that public sector unions will be stronger are elasticity of demand and direct political pressure. The argument with respect to elasticity of demand contends that the "essential" nature of many government services, coupled with limited opportunities for substitution of capital for labor in the production of these services, frequently results in quite inelastic demand for labor in the public sector.[14] The implication of this argument is clear: because public sector unions can push for increased wages with little fear of adverse employment effects, they will be able to achieve large wage gains through the (relatively unrestrained) exercise of bargaining power.

The political pressure argument, most strongly expressed by Wellington and Winter,[15] emphasizes the effects that public sector unions may have on wage decisions through lobbying and by providing election support to "pro-union" candidates. This type of direct intervention in the political process, then, is an alternative available to public sector unions for which there is no counterpart in the private sector.

The arguments above suggest that unions will be stronger in the public sector than in the private sector; however, one may also cite reasons for expecting the reverse to be true. As Freund[16] has noted, the ability of public sector unions to take advantage of inelastic demand through economic methods (e.g., the strike) depends on their ability to withhold a significant amount of labor. Hence, the union wage effect should be directly related to the degree of union organization and to the ability to strike. To the extent that existing legal barriers inhibit organization, union recognition, collective bargaining, and strikes in the public sector, union wage effects will be limited.

In addition, recent empirical work suggests that differences in elasticity of demand for labor between the public and private sectors are not nearly so great as implied by the elasticity of demand argument presented above.[17] If this is indeed the case, a major argument for expecting greater union wage effects in the public sector is undermined. Similarly, to the extent that there are legal restraints on the political activities of public sector unions, the political pressure argument for greater union wage effects in the public sector is weakened.

To summarize, then, a priori arguments concerning elasticity of demand and political pressure suggest that unions in the public sector will be inherently more powerful than unions in the private sector. At the same time, the presence of various legal restraints on public sector unions may serve to offset this advantage, and empirical evidence suggests that there are not great differences in elasticity of demand for labor between the public and private sectors. In view of these offsetting arguments, then, and in light of the empirical evidence cited above on union wage effects in the public and private sectors, we hypothesize that union wage effects in the public sector will not be greater than those in the private sector.

Data and Methodology

The data used here are from the National Longitudinal Surveys (NLS) of middle-aged males (45-59 years of age in 1966).[18] The sample is limited to wage and salary workers. A major advantage of this data set as compared to the one used by Hamermesh is that there are considerably more government employees and unionized government employees covered by the NLS data. There were 125 government workers in Hamermesh's sample of whites, and only 27 of these workers were unionized. In our sample of whites, by contrast, there are 375 government workers, of whom 122 are unionized. Hence, our estimates of union wage effects in the public sector are likely to have smaller standard errors and thus to be more reliable.

The human capital model of income distribution developed by Becker and Mincer[19] is used to derive a model for estimating earnings functions.

The primary focus of the human capital model is on investments in schooling and in on-the-job training. These investments are viewed as enhancing worker productivity, and hence, earnings. In addition, differences in various other individual and labor market characteristics have been shown to be systematically related to earnings.[20] Thus, we estimate earnings functions for 1971, controlling for class of worker and union status jointly,[21] and also controlling for schooling, work experience,[22] health status, marital status, region, and city size.[23]

The data do not permit identification of government workers by level of government--hence, we cannot make any empirical statements concerning the pay of federal government workers relative to that of state and local government workers.[24] Further, our earnings measure--hourly rate of pay--does not reflect differences between the public and private sectors in the stability of employment, nor does it include fringe benefits. Clearly, any conclusions from the data concerning the compensation of government employees relative to that of comparable private sector workers must be tempered by consideration of differences in the stability of employment and in fringe benefits between the two sectors.[25]

Several previous studies suggest that the public sector enjoys a relatively advantageous competitive pay position with respect to the compensation of black workers.[26] In light of this, and more generally, to allow for differences in the extent of discrimination against blacks between the public and private sectors, we have estimated separate earnings functions for blacks. The empirical results reported below further differentiate the sample by broad occupational grouping.[27] More

specifically, we have estimated separate wage equations for white-collar workers and for blue-collar workers.[28] In addition, wage equations were also estimated for each of the (one-digit) occupational groups separately (see Appendix Table A). However, the resulting small sample sizes make these latter estimates somewhat tenuous, and we have not reported the complete wage equations by occupation here.[29]

Empirical Results: White Workers

The estimated wage equations for white-collar and blue-collar whites in 1971 are shown in Table 1. A Chow test confirmed that these wage structures are significantly different.[30] The coefficient of each of the three class of worker/unionization variables measures the percentage difference in hourly earnings between the group in question and nonunion private sector workers, cet. par. For both white-collar and blue-collar whites, the hourly earnings of nonunion government workers are not significantly different from those of their counterparts in the private sector. Hence, employment in the public sector per se does not appear to be an important factor in determination of government/private differences in hourly wage rates.

The influence of unionization on wages within the public sector may be seen by comparing the coefficients in the second row of Table 1 with those in the first row. Among white-collar government workers, the earnings of those who are unionized are lower than the earnings of those who are not unionized, cet. par.[31] Among blue-collar government workers, however, there is a definite payoff to collective bargaining coverage. While the earnings of nonunion blue-collar government workers were not

Table 1: Wage Equations, Whites, 1971

Dependent Variable=LN WAGE (natural logarithm of the hourly wage rate)

Occupation Group	White Collar		Blue Collar	
Independent Variables	Coefficient	(Standard Error)	Coefficient	(Standard Error)
NUNGOV	.073	(.054)	-.039	(.044)
UNGOV	-.126	(.077)	.179**	(.055)
UNPRIV	-.084	(.066)	.238**	(.030)
S	.051**	(.0066)	.037**	(.0049)
X_c	.0111**	(.0017)	.0047**	(.0011)
MSO	-.185**	(.085)	-.128**	(.042)
HEALTH	-.196**	(.054)	-.053*	(.032)
NEAST	.137**	(.058)	.084**	(.037)
NCENT	.069	(.056)	.076**	(.037)
WEST	.238**	(.066)	.162**	(.044)
RES 1	-.021	(.070)	.032	(.040)
RES 2	.140**	(.061)	.112**	(.043)
RES 3	.079	(.069)	.155**	(.047)
RES 4	.088	(.059)	.109**	(.037)
Constant	.739**	(.097)	.700**	(.053)
R^2	.232		.217	
F	12.77**		22.18**	
S.E.E.	.493		.428	
Number of Observations	608		1136	

* = significant at the 10% level.
** = significant at the 5% level.

(continued - see next page)

Table 1 (continued)

Definitions of the variables:

NUNGOV = dummy variable equal to one if respondent is employed in the public sector and respondent's wages are not set by collective bargaining.
UNGOV = dummy variable equal to one if respondent is employed in the public sector and respondent's wages are set by collective bargaining.
UNPRIV = dummy variable equal to one if respondent is employed in the private sector and respondent's wages are set by collective bargaining.
S = years of schooling completed by respondent.
X_c = work experience at current job, in years.
MSO = dummy variable equal to one if respondent is not "married, spouse present."
HEALTH = dummy variable equal to one if respondent has a health problem which limits the amount or type of work he can do.
NEAST = dummy variable equal to one if respondent lives in the Northeast region of the country.
NCENT = dummy variable equal to one if respondent lives in the North Central region of the country.
WEST = dummy variable equal to one if respondent lives in the West region of the country.
RES1 = dummy variable equal to one if respondent lives in an urban place with population in excess of 25,000, or in an urbanized area with population under 250,000.
RES2 = dummy variable equal to one if respondent lives in an urbanized area with population in excess of 250,000 but less than 1 million.
RES3 = dummy variable equal to one if respondent lives in an urbanized area with population in excess of 1 million but less than 3 million.
RES4 = dummy variable equal to one if respondent lives in an urbanized area with population in excess of 3 million.

significantly different from those of their counterparts in the private sector, unionized blue-collar government workers earn approximately 18 percent more per hour than nonunion blue-collar workers in the private sector, cet. par.[32] The implicit relative wage effect of blue-collar unions within the public sector is thus somewhat greater than 20 percent, and it is highly significant.

Estimates of union wage effects in the private sector are provided directly by the coefficients in the third row of Table 1. The earnings of unionized white-collar workers in the private sector are not significantly different from those of their nonunion counterparts, cet. par. Among blue-collar workers, on the other hand, there is a significant union wage effect amounting to nearly 24 percent.[33] Our estimates here appear to be reasonably consistent with previous estimates of private-sector union wage effects by occupation group.[34]

The estimates for one-digit occupation groups (Appendix Table A) generally support the conclusions drawn from the white-collar and blue-collar equations (Table 1). With the exception of professional/technical workers and service workers, the hourly earnings of nonunion government workers are not significantly different from those of their counterparts in the private sector. Among white-collar government workers, the earnings of those who are unionized are not significantly different from the earnings of those who are nonunion; but among blue-collar government workers, those who are unionized have significantly higher earnings than those who are not, cet. par., for each group except service workers. Thus, the data for one-digit blue-collar occupations support the contention that there is a definite

payoff to collective bargaining coverage in the public sector: for the two groups (craftsmen/foremen and operatives) which constitute the bulk (80 percent) of the blue-collar sample, the implicit union wage effects in the public sector are approximately 17 percent and 20 percent, respectively.

Empirical Results: Black Workers

Table 2 shows the estimated wage equations for 1971 for white-collar and blue-collar blacks. In general, wage differentials by class of worker and union status are quite different for blacks than for whites. More specifically, the earnings of both white-collar[35] and blue-collar black workers in government but not unionized are significantly higher than those of their nonunion counterparts in the private sector, by more than 30 percent and 20 percent, respectively. Hence, in contrast with the situation for whites, and in support of the conclusions of the National Manpower Council and of Fogel and Lewin, it appears that governmental employers do indeed enjoy a strong competitive pay position with respect to both white-collar and blue-collar black workers.

Examination of union wage effects within the public sector (the difference between the coefficients in row 2 and those in row 1) reveals no evidence of a positive wage effect of unions for white-collar blacks in government. Among blue-collar blacks in government, however, there is a positive and significant union wage effect of approximately 12 percent. Thus, for both whites and blacks, the empirical evidence suggests that unions in the public sector have been successful in raising the relative earnings of blue-collar workers, but that they have not done so for white-collar workers.

Table 2: Wage Equations, Blacks, 1971

Dependent Variable=LN WAGE (natural logarithm of the hourly wage rate)

Occupation Group	White Collar		Blue Collar	
Independent Variables[a]	Coefficient	(Standard Error)	Coefficient	(Standard Error)
NUNGOV	.327**	(.096)	.206**	(.048)
UNGOV	.307**	(.119)	.323**	(.057)
UNPRIV	.339**	(.118)	.314**	(.038)
S	.058**	(.011)	.012**	(.0045)
X_c	.0039	(.0035)	.0044**	(.0015)
MSO	-.091	(.103)	-.058*	(.035)
HEALTH	.232**	(.101)	-.040	(.041)
NEAST	.181	(.154)	.150**	(.059)
NCENT	.032	(.125)	.183**	(.047)
WEST	.012	(.186)	.293**	(.074)
RES 1	-.008	(.125)	.040	(.047)
RES 2	.397**	(.127)	.208**	(.046)
RES 3	.499**	(.120)	.217**	(.050)
RES 4	.248	(.155)	.213**	(.059)
Constant	.046	(.173)	.540**	(.041)
R^2	.556		.413	
F	7.51**		30.07**	
S.E.E.	.345		.360	
Number of Observations	99		614	

[a] For definitions of the variables, see Table 1.
* = significant at the 10% level.
** = significant at the 5% level.

Union wage effects on the earnings of blacks in the private sector (row 3) are substantial for both white-collar and blue-collar workers. The coefficients are highly significant, and in each case the data indicate that the relative wage effect is in excess of 30 percent. Here, as elsewhere, the evidence suggests that the relative payoff to collective bargaining coverage in the private sector is greater for blacks than it is for whites.[36]

As was the case for whites, the estimates for blacks for one-digit occupation groups (Appendix Table A) generally support the conclusions drawn from the white-collar and blue-collar equations (Table 2). The hourly earnings of nonunion blacks in government are significantly higher than those of their counterparts in the private sector for four of the five occupation groups for which results are reported. There is no evidence of a significant union wage effect within the public sector for black clerical workers, craftsmen/foremen, or operatives; but there are significant union wage effects for black laborers and service workers, amounting to 18 percent and 21 percent, respectively. In addition, there are significant union wage effects in the private sector for each of the five occupation groups.

Relative Wage Effects of Unions in the Public and Private Sectors

There is no evidence of a positive union wage effect within the public sector on the earnings of either white or black men in white-collar jobs. In the private sector, there is a substantial union wage effect among black men in white-collar jobs, but no evidence of a positive effect of unions on the earnings of white workers in white-collar jobs.

Among blue-collar workers, union wage effects within the public sector are present for both whites and blacks. These effects exceed 20 percent and 10 percent, respectively. However, the estimated union wage effects in the private sector for blue-collar workers approach 25 percent in the case of white men and exceed 30 percent in the case of blacks. Thus, there is no evidence to support the contention that union wage effects within the public sector are inherently larger than those in the private sector.[37] In this regard, the findings here parallel those of Hamermesh and of other investigators. Our estimates of the relative wage effects of government unions on the earnings of blue-collar workers exceed Hamermesh's estimates of union wage effects in government; however, this probably reflects our use of collective bargaining coverage rather than union membership to identify "unionized" workers, as well as the fact that we estimated separate wage equations by broad occupational group.[38]

In addition to examining union wage effects within the public and private sectors, we can also directly compare the earnings of unionized workers in the two sectors (i.e., compare the row 3 coefficients with the row 2 coefficients of Tables 1 and 2). Relative to the earnings of nonunion workers in the private sector, the hourly earnings of unionized workers both in government and in the private sector are significantly higher, cet. par., for all but the white men in white-collar jobs. Among blacks, the earnings of unionized workers in the public sector are comparable to the earnings of unionized workers in the private sector, cet. par., for both white-collar and blue-collar workers. However, among white men in blue-collar jobs (the largest group in the sample), the hourly earnings

of unionized workers in the private sector are approximately 24 percent above those of their nonunion counterparts, cet. par., while unionized government workers earn approximately 18 percent more per hour than do nonunion workers in the private sector, cet. par.

As noted above, Fogel and Lewin argue that for occupations in which unionized workers in the private sector have been able to obtain a wage advantage over their nonunion counterparts, public sector wages will tend toward the private union wage level. The data for blue-collar whites do not support this argument: unionized government workers earn slightly less than unionized private sector workers, while nonunionized government workers earn substantially less, cet. par.[39] The hourly earnings of both white-collar and blue-collar blacks in government do appear to be close to those of their unionized counterparts in the private sector. However, this may well be a consequence of lesser wage discrimination against blacks in government and in unions than in the nonunion private sector, rather than a reflection of a tendency for wages in government to match private sector wages that have been raised through market power.

To summarize, then, it is clear that across the four race-occupation group subsamples, the hourly earnings of unionized workers in the public sector tend consistently to be either on a par with or somewhat below the hourly earnings of unionized workers in the private sector, once we control for individual worker characteristics, region, city size, and occupation group.[40] Again, the data do not support the argument that government unions necessarily will be more powerful than unions in the private sector.

Footnotes

[1]More precisely, it is the role of collective bargaining which is being analyzed. The terms "unionized worker" and "unionized employment" are used here to refer to workers and jobs covered by collective bargaining agreements. This procedure is not identical to considering as "unionized" only those individuals who belong to labor unions: our definition of "unionized" includes workers who belong to professional associations and (since bargaining is for members and nonmembers alike) some workers who are not "union" members--so long as their wages are set by collective bargaining. By the same token, workers who are union members but whose wages are not set by collective bargaining are considered here as "nonunion." Since it is presumably through the mechanism of collective bargaining that unions influence wage determination, the definition of "unionized" employed here is more appropriate than a definition based simply on union membership and ignoring collective bargaining coverage. The use of a union membership variable as a proxy for collective bargaining coverage will tend to bias the estimated wage effect of collective bargaining downward, since some nonmembers will be covered by collective bargaining and some union members may not be covered.

[2]For example, see National Manpower Council, Government and Manpower (New York: Columbia University Press, 1964); U.S. Department of Labor, Bureau of Labor Statistics, National Survey of Professional, Administrative, Technical, and Clerical Pay (Washington, D.C.: G.P.O., 1970); and Stephen H. Perloff, "Comparing Municipal Salaries with Industry and Federal Pay," Monthly Labor Review, Vol. 94, No. 10 (October 1971), pp. 46-50.

[3]Studies of teachers include Hirschel Kasper, "The Effects of Collective Bargaining on Public School Teachers' Salaries," Industrial and Labor Relations Review, Vol. 24, No. 1 (October 1970), pp. 57-72; Robert J. Thornton, "The Effects of Collective Negotiations on Teachers' Salaries," Quarterly Review of Economics and Business, Vol. II, No. 4 (Winter 1971), pp. 37-46; W. Clayton Hall and Norman E. Carroll, "The Effects of Teachers' Organizations on Salaries and Class Size," Industrial and Labor Relations Review, Vol. 26, No. 2 (January 1973), pp. 834-841; and David B. Lipsky and John E. Drotning, "The Influence of Collective Bargaining on Teachers' Salaries in New York State," Industrial and Labor Relations Review, Vol. 27, No. 1 (October 1973), pp. 18-35.

[4]Two principal studies of fire fighters are Orley Ashenfelter, "The Effect of Unionization on Wages in the Public Sector: The Case of Fire Fighters," Industrial and Labor Relations Review, Vol. 24, No. 2 (January 1971), pp. 191-202; and Ronald G. Ehrenberg, "Municipal Government Structure, Unionization, and the Wages of Fire Fighters," Industrial and Labor Relations Review, Vol. 27, No. 1 (October 1973), pp. 36-48.

[5]For example, see Roger Schmenner, "The Determination of Municipal Employee Wages," Review of Economics and Statistics, Vol. 55, No. 1 (February 1973), pp. 83-90; and James L. Freund, "Market and Union Influences on Municipal Employee Wages," Industrial and Labor Relations Review, Vol. 27, No. 3 (April 1974), pp. 391-404.

[6]Daniel S. Hamermesh, "The Effect of Government Ownership on Union Wages," in Daniel S. Hamermesh, ed., Labor in the Public and Nonprofit Sectors (Princeton, N.J.: Princeton University Press, 1975), pp. 227-255.

[7]Walter Fogel and David Lewin, "Wage Determination in the Public Sector," Industrial and Labor Relations Review, Vol. 27, No. 3 (April 1974), pp. 410-431.

[8]Hamermesh, "The Effect of Government Ownership on Union Wages," pp. 253-254.

[9]Fogel and Lewin, "Wage Determination in the Public Sector," pp. 428-430. These conclusions regarding the relative pay of government workers by skill level are similar to those of the National Manpower Council. The National Manpower Council also noted that "Governmental employers, especially on the Federal level, have enjoyed a fairly strong competitive pay position with respect to women professional and managerial employees and to Negro workers on almost every skill level." See Government and Manpower, p. 33.

[10]Fogel and Lewin argue that public sector unions have probably contributed to increases in the relative pay of public sector workers in recent years; but they quickly add that "the extent to which governmental wage increases are due to unionization as distinct from the increasing politicization of public wage-setting processes is not clear." See "Wage Determination in the Public Sector," p. 415, footnote 15.

[11]"Wage Determination in the Public Sector," pp. 423-425.

[12]For example, see the studies cited in footnote 2.

[13]Discussion of the economic theory and effects of unionism may be found in Albert Rees, The Economics of Trade Unions (Chicago: University of Chicago Press, 1962); and H. Gregg Lewis, Unionism and Relative Wages in the United States (Chicago: University of Chicago Press, 1963). Several recent empirical studies that have documented the presence of union wage effects in the private sector are cited below.

[14]For a recent empirical study that provides some support for this argument, see Ronald G. Ehrenberg, "The Demand for State and Local Government Employees," American Economic Review, Vol. 63, No. 3 (June 1973), pp. 366-379.

[15]Harry H. Wellington and Ralph K. Winter, Jr., The Unions and the Cities (Washington, D.C.: The Brookings Institution, 1971).

[16]Freund, "Market and Union Influences on Municipal Employee Wages," p. 393.

[17]Evidence to this effect is presented in Orley C. Ashenfelter and Ronald G. Ehrenberg, "The Demand for Labor in the Public Sector," in Hamermesh, ed., Labor in the Public and Nonprofit Sectors, pp. 55-78. The differences between the conclusions of this study and those of the study cited in footnote 14 suggest that further work on estimating the elasticity of demand for labor in both the public and private sectors would be most desirable.

[18]The NLS data cover four cohorts: males aged 45-59, males aged 14-24, females aged 30-44, and females aged 14-24. The cohort of older males was chosen for this study. For a complete description of the data on older males, see Herbert S. Parnes et al., The Pre-Retirement Years: Five Years in the Work Lives of Middle-Aged Men (Columbus, Ohio: Center for Human Resource Research, 1974). Clearly, the fact that our sample is confined to older workers raises the possibility that it is not representative of the entire male labor force (in particular, decisions concerning early retirement could potentially bias our results). However, as noted below (see footnote 40), our results appear to be generally consistent with previously published work. In addition, preliminary estimates for the cohort of young males are consistent with the hypothesis that union wage effects in the public sector are no greater than those in the private sector.

[19]For discussion of the model, see Gary S. Becker, Human Capital and the Personal Distribution of Income: An Analytic Approach, Woytinsky Lecture No. 1 (Ann Arbor: University of Michigan, 1967); Jacob Mincer "The Distribution of Labor Incomes: A Survey with Special Reference to the Human Capital Approach," Journal of Economic Literature, Vol. 8, No.1 (March 1970), pp. 1-26; and Gary S. Becker and Barry R. Chiswick, "Education and the Distribution of Earnings," American Economic Review Papers and Proceedings, Vol. 56, No. 2 (May 1966), pp. 358-369.

[20]For example, see Ronald Oaxaca, "Male-Female Wage Differentials in Urban Labor Markets," International Economic Review, Vol. 14, No. 3

(October 1973), pp. 693-709; and Sharon P. Smith, "Government Wage Differentials by Sex," Journal of Human Resources, Vol. 11, No. 2 (Spring 1976), pp. 185-199.

[21]As Hamermesh notes, most microeconomic data sets do not provide information on union status for workers employed in the public sector. However, the 1971 NLS survey included the question, "Are your wages set by collective bargaining?" Those who answered in the affirmative were treated as "unionized" workers, and cross-classification with the class-of-worker variable (government or private) provided four mutually exclusive and exhaustive categories--nonunion government (NUNGOV), "unionized" government workers (UNGOV), nonunion private-sector workers (NUNPRIV) and unionized private-sector workers (UNPRIV).

[22]The equations reported below use "experience on current job" as the measure of work experience. Alternative specifications of work experience were also used (including potential experience, previous experience, and quadratic specifications), but they were generally insignificant. In any case, the specification of the work experience variable had very little impact on the estimates of union wage effects in the public and private sectors.

[23]Significant differences in earnings by health status, marital status, region, and city size have been reported in the studies cited in footnote 20. Alternative specifications of the earnings functions are clearly plausible - e.g., including dummy variables for occupation and industry, and measures of local labor market conditions. As noted below, our sample is stratified by occupation, and separate equations are estimated for each one-digit occupation group. Inclusion of industry variables seems plausible; however, as Smith has noted ("Government Wage Differentials by Sex," p. 186), since public administration constitutes one "industry," controlling for industry tends to obscure measurement of public/private pay differentials. Finally, we did control for the local labor market unemployment rate in 1971, as a measure of labor market conditions. The coefficient of this variable was never significant, and inclusion of the variable resulted in virtually no change in the union/government coefficients; hence, it has been deleted from the specifications reported here.

[24]Smith's study ("Government Wage Differentials by Sex") considered the relative pay of government workers by level of government. Smith found that for males (blacks and whites combined), relative to the pay of private sector workers, the pay of federal government workers was 19 percent higher, that of state government workers was not significantly different, and that of local government workers was nearly 5 percent lower, ceteris paribus. While this study is not confined to any one level of government, our inability to control for level of government does create some

problems regarding comparisons between unionized and nonunionized workers in the public sector. To the extent that the state/local government sector is more heavily unionized than the federal sector, differences in hourly earnings between unionized and nonunionized public workers in our sample may (at least partially) reflect the effects of level of government in addition to reflecting the effects of unionization. Given the wage differentials by level of government reported by Smith, a tendency for unionized government employees to be disproportionately state/local would result in a bias toward understating union wage effects in the public sector. The magnitude of such a bias would depend on the strength of the correlation between level of government and union status. For further discussion, see footnote 31 below.

[25]To the extent that government employment is more stable than employment in the private sector, our estimates will understate the relative compensation of public sector employment, since monthly or annual earnings of public employees would exceed those of private-sector workers even if hourly wages are the same. With regard to fringe benefits, Smith states that in 1970, fringe benefits as a percentage of total compensation were slightly higher in the federal government than in the private sector (27.8 percent as compared to 26.6 percent); while Hamermesh, referring to a study by the National League of Cities, 1970 National Survey of Employee Benefits for Full-Time Personnel of U.S. Municipalities (Washington, D.C.: National League of Cities, 1972), states that for public workers in general the ratio of fringes to total compensation is higher than in the private sector by .8 percentage points. See Sharon P. Smith, "Pay Differentials Between Federal Government and Private Sector Workers," Industrial and Labor Relations Review, Vol. 29, No. 2 (January 1976), p. 180; and Hamermesh, "The Effect of Government Ownership on Union Wages," p. 245; respectively. Thus, it appears that failure to explicitly consider fringe benefits here will result in a small understatement of the relative compensation of public sector workers.

[26]For example, see National Manpower Council, Government and Manpower, p. 33, and Fogel and Lewin, "Wage Determination in the Public Sector," p. 412. In addition, Oaxaca's estimated earnings equations for males indicate that among whites, government employees have wage rates which are 6 percent higher than those of nonunion workers in the private sector, cet. par., while the corresponding differential among blacks is in excess of 13 percent. See Oaxaca, "Male-Female Wage Differentials in Urban Labor Markets," p. 700.

[27]We have considered only those occupations containing both private and public sector workers. Hence, our white-collar workers include professional and technical workers, managers and officials, and clerical workers (but not sales workers); while our blue-collar workers include craftsmen and foremen, operatives, non-farm laborers, and service workers

(excluding domestic service workers, as well as farmers, farm managers, and farm laborers). Since workers in the omitted occupations will tend (as a group) to have lower mean wages than workers in the included occupations, it should be clear that the gross pay differential between government and private-sector workers will be less favorable to government workers in our sample than would be the case in a sample covering all occupations. Alternatively, aggregative studies which fail to control for occupation will generally overstate the relative earnings of government workers, since these workers are more favorably distributed (for higher wages) by occupation than are workers in the private sector.

[28]The conclusions of the National Manpower Council in Government and Manpower and of Fogel and Lewin in "Wage Determination in the Public Sector" suggest that consideration of relative compensation in the public sector would do well to distinguish between blue-collar and white-collar workers. The quite different union wage effects for white-collar and blue-collar workers in manufacturing estimated by Hamermesh also indicate that this differentiation of the sample by occupation is desirable. See Daniel S. Hamermesh, "White Collar Unions, Blue Collar Unions and Wages in Manufacturing," Industrial and Labor Relations Review, Vol. 24, No. 2 (January 1971).

[29]The full set of estimates is available from the author on request.

[30]Chow tests were also computed to test for equality of wage structures between white-collar and blue-collar blacks, between white-collar whites and white-collar blacks, and between blue-collar whites and blue-collar blacks. In all cases, the tests indicated that the sets of coefficients were significantly different. See Gregory C. Chow, "Tests of Equality Between Sets of Coefficients in Two Linear Regressions," Econometrica, Vol. 28, No. 3 (July 1960), pp. 591-605.

[31]As reported, the coefficients of NUNGOV and UNGOV are not significant-i.e., the earnings of white-collar government workers, union and nonunion, are not significantly different from the earnings of nonunion private sector workers, cet. par. However, the two coefficients are significantly different from one another. On the surface, this implies that white-collar unions in government have a negative wage effect; but this seems most implausible. It seems more likely that the unionization variable is serving as a proxy for something else. Two factors that might be relevant here are occupation and level of government. That is, one might argue that among white-collar whites, those who are most likely to be nonunion are those in the high-skilled occupations. If this were the case, the unionization variable could be reflecting the effects of occupation rather than unionization. An alternative (and not mutually exclusive) explanation is that the workers who are most likely to be nonunion are those employed by the federal government. If unionized

white-collar workers tend to be employed by state and local governments while federal white-collar employees tend to be nonunion, the unionization variable could be reflecting the effects of level of government. The data provide support for the first argument: clerical workers make up just over 20 percent of the white-collar sample, but they account for nearly 60 percent of the unionized white-collar workers and less than 15 percent of the nonunionized workers. Hence, those in the high-skilled occupations are more likely to be nonunion. In addition, the three-digit industry and occupation codes of all government workers in our sample have been examined in an effort to ascertain level of government and its relationship to union status. For the 171 white-collar whites in government, this procedure yields the following distribution

Union Status	Level of Government		
	Federal	State/local	Not identified
Unionized	26	20	2
Nonunion	44	43	36

The ample numbers of unionized federal workers and nonunion state/local workers do not provide support for the level-of-government argument. Thus, the peculiar results here appear to be caused by the fact that clerical workers are disproportionately represented among unionized workers. In any case, the results in Table 1 and those for one-digit occupation groups in Appendix Table A do not support the hypothesis that unionization of white-collar white government workers results in significant gains in earnings.

[32]Again, it is possible that correlations between unionization and level of government may be influencing the estimates. Level of government can be identified for nearly 63 percent of the white government workers in blue-collar jobs; within this group, federal employees account for 22 percent of the unionized workers and 30 percent of the nonunion workers. Hence, close inspection of the data does not provide much support for this hypothesis. Similarly, consideration of union status by level of government for blacks does not support the notion that unionized workers are predominantly state/local while nonunion workers are predominantly federal.

[33]The correlations for white-collar workers between one-digit occupation group and union status (discussed in the footnote 31) may cause some concern as to whether the same sorts of correlations are present among the blue-collar workers. That is, one might argue that the large wage effects of blue-collar unions result from a reference group - the nonunion private sector - which contains many unskilled jobs. However, the data do not support this contention: among all of the blue-collar whites in the sample, just under half are craftsmen/foremen and a third

are operatives; while among those who are in the nonunion private sector, 52 percent are craftsmen/foremen and 29 percent are operatives. Laborers and service workers constitute 8 percent and 11-12 percent respectively, of both the total and nonunion private samples. Hence, the evidence for occupation does not suggest that the reference group contains a disproportionate number of unskilled jobs.

[34]Hamermesh, in "White Collar Unions, Blue Collar Unions and Wages in Manufacturing," estimated union wage effects in manufacturing of approximately 5 percent for white-collar (clerical) workers and 20 percent for blue-collar workers.

[35]Since the sample of black workers in white-collar jobs is quite small, the coefficients of the class of worker/unionization variables should be viewed with some caution.

[36]Oaxaca estimates overall union wage effects in the private sector of 11.3 percent for whites and 25.1 percent for blacks. See Ronald Oaxaca, "Estimation of Union/Nonunion Wage Differentials Within Occupational/Regional Subgroups," Journal of Human Resources, Vol. 10, No. 4 (Fall 1975), pp. 529-537. Comparable estimates from the NLS data--i.e., estimates obtained by pooling the white-collar and blue-collar groups--are 10.2 percent for whites and 28.7 percent for blacks.

[37]This argument is made in Wellington and Winter, The Unions and the Cities.

[38]That is, we are suggesting that if we pooled our white-collar and blue-collar samples, the resulting estimates of the relative wage effect of government unions would more nearly approximate Hamermesh's estimates. The thrust of much of this paper, however, is that such pooled estimates are not likely to reflect accurately the experience of any particular group, but rather are simply a composite of the (perhaps quite different) experiences of various constituent groups.

[39]This does not necessarily imply that there is no spillover of private sector union wages into the public sector. The presence of positive union wage effects in the private sector may have contributed to increasing public sector wages over what they would otherwise have been. However, the data do not support the contention that wages in government will tend to match private sector wages that have been raised through market power.

[40]As noted above, the fact that our data set is confined to older workers suggests that we must be cautious in contending that our findings

are an accurate description of reality for the economy as a whole. However, the similarity of the findings here to those of Hamermesh and (with respect to private-sector union wage effects) Oaxaca are encouraging in this regard, since they both utilized data sets which were samples of the entire economy. See Hamermesh, "The Effect of Government Ownership on Union Wages," and Oaxaca, "Estimation of Union/Nonunion Wage Differentials Within Occupational/Regional Subgroups."

APPENDIX

Table A: Coefficients of Class of Worker/Unionization[a] Variables for 1-Digit Occupation Groups by Race, 1971

(Standard errors in parentheses)

Occupation	Whites			Blacks		
(No. of Observations-Whites/No. of Observations - Blacks)	NUNGOV	UNGOV	UNPRIV	NUNGOV	UNGOV	UNPRIV
Professional and Technical Workers (204/34)	.213** (.096)	.026 (.163)	.314* (.161)	b	b	b
Managers and Officials (279/13)	.060 (.083)	-.163 (.241)	-.065 (.108)	b	b	b
Clerical Workers (125/52)	.136 (.090)	.085 (.081)	-.113 (.086)	.267** (.129)	.284** (.118)	.180* (.108)
Craftsmen and Foremen (536/119)	-.033 (.047)	.137** (.065)	.170** (.029)	.271** (.094)	.309** (.106)	.380** (.076)
Operatives (380/211)	.096 (.062)	.293** (.084)	.276** (.035)	.243* (.131)	.212 (.168)	.202** (.079)
Laborers (non-farm) (94/151)	-.202 (.202)	.259 (.267)	.277 (.185)	.103 (.083)	.284** (.098)	.363** (.069)
Service Workers (126/133)	.334** (.162)	.397** (.176)	.315 (.223)	.258** (.065)	.468** (.078)	.256** (.072)

[a] The coefficients reported here correspond to those reported in the first three rows of Tables 1 and 2.

[b] Coefficients are not reported due to small sample size (N<50).

* = significant at the 10% level.

** = significant at the 5% level.

APPENDIX

Table B

Variable Means

	Whites		Blacks	
Variable[a]	White Collar	Blue Collar	White Collar	Blue Collar
UNGOV	.079	.065	.172	.090
NUNGOV	.202	.114	.313	.127
UNPRIV	.120	.475	.222	.404
S	12.75	9.26	11.33	6.80
X_c	17.22	14.28	17.62	13.79
MSO	.061	.106	.152	.230
HEALTH	.166	.195	.172	.151
NEAST	.291	.305	.172	.117
NCENT	.280	.302	.232	.223
WEST	.153	.153	.051	.055
RES 1	.102	.134	.131	.158
RES 2	.155	.111	.141	.182
RES 3	.107	.085	.222	.148
RES 4	.186	.181	.293	.210
WAGE	6.16	4.10	4.17	3.10
LN WAGE	1.676	1.327	1.308	1.039
Number of Observations	608	1136	99	614

[a]For definitions of the variables, see Table 1.